

(6450-01-P)

DEPARTMENT OF ENERGY

Office of Energy Efficiency and Renewable Energy

Building Energy Codes Program: Workshop on Analysis of Standard 90.1-1999

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy

ACTION: Notice of Public Workshop.

SUMMARY: The Department of Energy is in the process of making a determination as to whether ASHRAE/IESNA Standard 90.1-1999 would save energy in commercial buildings. In doing so, we are performing a comparative analysis of the 1989 edition of that standard to the 1999 edition and seeking input on our proposed approach to carrying out that analysis.

DATES: The Department will hold a public workshop on February 17, 2000, in Washington, DC. Please send requests to speak at the workshop so that we receive them by 4:00 p.m., February 14, 2000. The Department must also receive ten (10) copies of statements to be given at the public workshop no later than 4:00 p.m., February 15, 2000, and we request that you provide a computer diskette of each statement in WordPerfect™ at that time.

ADDRESSES: Please address requests for the proposed methodology for the comparative analysis or requests to make statements at the public workshop and copies of those statements to Brenda Edwards-Jones at the following address: U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, EE-41, 1000 Independence Avenue, SW, Washington, DC

20585-0121. You should identify documents as either, "Request for Proposed Methodology," or "Request to Speak," or "Statement," followed by, "Workshop on Analysis of Standard 90.1-1999". The workshop will begin at 9:00 a.m., on February 17, 2000, in Room 1E-245 at the U.S. Department of Energy, Forrestal Building, 1000 Independence Avenue, SW, Washington, DC.

You can read copies of the transcript of the public workshop in the Freedom of Information Reading Room (Room No. 1E-190) at the U.S. Department of Energy, Forrestal Building, 1000 Independence Avenue, SW, Washington, DC, between the hours of 9:00 a.m. and 4:00 p.m., Monday through Friday, except Federal holidays. You may obtain copies of the referenced standard ASHRAE/IESNA Standard 90.1-1999 by request from the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., 1791 Tullie Circle, NE, Atlanta, GA 30329, (404) 636-8400, <http://www.ASHRAE.org>. You may obtain a copy of the "Proposed Methodology for a Comparative Analysis of ASHRAE/IESNA Standard 90.1-1989 and Standard 90.1-1999" from the Department by request from the address listed above. The proposed methodology may also be downloaded from the Office of Building Research and Standards web site listed below.

The latest information regarding the public workshop is available on the Office of Building Research and Standards web site at the following address:

http://www.eren.doe.gov/buildings/codes_standards/notices/notc0027/.

FOR FURTHER INFORMATION CONTACT: Jean J. Boulin, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, EE-42, 1000 Independence Avenue, SW, Washington, DC 20585-0121, (202) 586-9870, email: Jean.Boulin@EE.DOE.gov

SUPPLEMENTARY INFORMATION:

I. Introduction

A. Authority

Section 304(b)(2) of Title III of the Energy Conservation and Production Act, as amended (ECPA or Act), requires the Secretary of Energy (We, DOE, or the Department) to determine whether the revisions of ASHRAE/IESNA Standard 90.1 embodied in the 1999 edition will improve energy efficiency in commercial buildings. A notice of the determination is required to be published in the *Federal Register*. If the Secretary makes an affirmative determination, each State is required to review and update the provisions of its commercial building code regarding energy efficiency in accordance with Standard 90.1-1999. Each State is further required, within two years of an affirmative determination, to certify and demonstrate to the Secretary that its State commercial building code meets or exceeds the revised standard. If, on the other hand, the Secretary determines that Standard 90.1-1999 will not improve energy efficiency in commercial buildings, then State commercial code provisions regarding energy efficiency shall continue to meet or exceed Standard 90.1-1989.

B. Background

In preparation for making the determination, we are doing a comparative analysis between the 1989 edition and 1999 edition of Standard 90.1. An initial analysis was prepared in the summer of 1999 and the results were presented to the Standing Standards Project Committee 90.1, the ASHRAE committee responsible for revising Standard 90.1. It was also shared with other interested parties. At that time we identified the shortcomings that we perceived in the analysis, and suggested how some could be resolved. Comments were requested on these issues and other issues that people might identify. We have developed an approach to complete that analysis that addresses these issues. We are holding a workshop to obtain comment on the approach and to identify any other issues. This workshop is the subject of today's notice.

C. Summary of Proposed Comparative Analysis

We propose to carry out both a qualitative and quantitative comparison of the Standard 90.1-1989 and Standard 90.1-1999. The proposed analysis would provide qualitative comparisons of the stringencies between the two editions of Standard 90.1 in the scope of the standard; the building envelope requirements; the building lighting requirements; the building mechanical equipment requirements; and the paths to compliance. The quantitative comparison of energy codes would be done on whole building energy simulations of buildings built to each standard. We propose to simulate seven representative building types in 11 representative U.S. climates. The detailed methodology for the quantitative comparison is presented in "Proposed Methodology for a Comparative Analysis of ASHRAE/IESNA Standard 90.1-1989 and Standard 90.1-1999."

II. Discussion

A. Proposed Comparative Analysis of Standard 90.1-1989 and Standard 90.1-1999

We propose to carry out both a qualitative and quantitative comparison of the Standard 90.1-1989 and Standard 90.1-1999.

Qualitative Comparisons

The proposed analysis would provide qualitative comparisons of the stringencies between the two editions of Standard 90.1 in each of the following areas:

Scope of the standard,

Building envelope requirements,

Building lighting requirements,

Building mechanical equipment requirements,

Paths to compliance.

The emphasis of the qualitative comparison would differ between the envelope, lighting, and mechanical sections. In the building envelope section, the comparison would focus on the impact of the different building envelope requirements on the building heating and cooling loads for different building types and climates. The envelope comparison would examine requirements for all envelope components, including roofs, walls, floors, and fenestration as well as explore variations in construction types and in the window-to-wall ratio.

In the lighting requirements comparison, the focus would be primarily on the impact the different lighting requirements have on lighting energy use, as well as on building loads. The comparison would look separately at the whole building and space-by-space lighting requirements in both standards in a variety of commercial building types, as well as examine the affect of any “additional lighting power allowances.”

The mechanical requirements comparison would be divided into comparisons of equipment efficiency requirements and system design requirements. The system design requirements affect both the system efficiency, system load, and may have direct energy impacts due for instance to fan design. Tables of relative stringency and estimated positive or negative national energy impact would be prepared based on practical application of the system design requirements in each standard.

Each standard has multiple ways to demonstrate compliance. We would enumerate the multiple paths to compliance, but do not propose a detailed comparison of the relative stringency of alternate paths internal to a single standard or between standards. The large quantity of variables among the alternative compliance paths would make such analysis prohibitive to undertake. Further, we know of no data on which to base the selection of representative requirements for such an analysis. Assignment of requirements would be arbitrary. Rather we would focus on what we believe is the most common approach to using the standard in question for particular building types.

Quantitative comparison

We propose to base the quantitative comparison of energy codes on whole building energy simulations of buildings built to each standard. We would simulate seven representative building types in 11 representative U.S. climates. The simulated buildings would utilize the 15 zone building prototype used in previous DOE building research, and the energy use intensities for each zone from the simulations would be scaled to correctly reflect variations in characteristic building sizes and shapes for each representative building type. Energy Use Intensities (EUIs) developed for each representative building type would be weighted by total national square footage in each representative building category to provide an estimate of the national energy savings. Note that only changes to new buildings would be considered in this quantitative analysis. The scope of ASHRAE 90.1-1999 also addresses additions and renovations to existing buildings. While this may have a significant energy impact, we do not believe the data is available to quantify this impact. We propose to point out this difference in the qualitative comparison of the two standards.

B. Public Workshop

1. Procedures for Submitting Requests to Speak

You will find the time and place of the public workshop listed at the beginning of this notice. The Department invites any person who would like to attend the public workshop to notify Brenda Edwards-Jones at (202) 586-2945. You may hand deliver requests to speak to the address indicated at the beginning of this notice between the hours of 8:00 a.m. and 4:00 p.m., Monday through Friday, except Federal holidays, or send them by mail.

2. Conduct of Workshop

The workshop will be conducted in an informal, conference style. The Department may use a professional facilitator to facilitate discussion, and a court reporter will be present to record the transcript of the meeting. We will present summaries of comments received before the workshop, allow time for presentations by workshop participants, and encourage all interested parties to share their views on issues affecting the proposed analysis. Following the workshop, we will provide an additional one week comment period, during which interested parties will have an opportunity to present further comment on the proposed analysis.

The Department will arrange for a transcript of the workshop and will make the entire record of the workshop, including the transcript, available for inspection in the Department's Freedom of Information Reading Room. Any person may purchase a copy of the transcript from the transcribing reporter.

C. Issues Requested for Comment

The Department of Energy is interested in receiving comments and/or data concerning issues relating to the comparative analysis of Standard 90.1-1989 and Standard 90.1-1999. We are especially interested in any comments or data regarding:

- 1) The seven building types listed below and selected for analysis

- 2) The 11 representative climate locations proposed for the analysis
- 3) The frequency of use of alternative paths to compliance in building standards (e.g. space-by-space versus whole building lighting power allowances)
- 4) New non-residential building construction data by state or census division and building type
- 5) Data to quantify the impact of Standard 90.1-1999 on additions and renovations to existing buildings.
- 6) The prevalence of the semi-heated building envelope subcategory in the building types proposed for analysis.
- 7) Specific comments on the preliminary energy savings analysis distributed in June 1999.

The seven building types proposed for the analysis are Office, Retail, Education, Lodging, Public Assembly, Food Service, and Warehouse and Storage. It is currently proposed to include outpatient health care buildings in the office building category. These buildings together will account for approximately 80% of commercial building energy use, and national weights for each of these building categories can be readily obtained through the Commercial Buildings Energy Consumption Survey (CBECS) data. One category of building which is conspicuously absent is multifamily dwellings over three stories above grade. Relevant data on current stock, construction, or building configuration for this category would allow its inclusion in the analysis.

The 11 climate variations proposed for the analysis are the same as those used in the National Energy Model, version 5, and in the initial analysis and they are proposed to be represented by the same climate locations used in that analysis. The climate locations are: Providence, Rhode

Island; Detroit, Michigan, Minneapolis, Minnesota; Knoxville, Tennessee; Shreveport, Louisiana, Tampa, Florida; Denver, Colorado; Phoenix, Arizona; Seattle Washington; Fresno, California; and Los Angeles, California. We would be interested to know of any data or analysis that would indicate that these are inappropriate for this analysis, and what alternatives are more appropriate and why.

This analysis proposes to set criteria for buildings using what are believed to be the most common paths to compliance. Any data describing the relative frequency of use of alternative paths to compliance would be appreciated as would more detailed data on building construction by State, region and building type. Additionally, we are interested in data regarding the type and fraction of buildings which should be modeled as semi-heated buildings for the 90.1-1999 standard. Finally, as the methodology proposed is an extension of what was done for the preliminary analysis in June, any comments on that methodology and the questions raised in the presentation, would be appreciated.

These data will help us to make a determination whether ASHRAE/IESNA Standard 90.1-1999 will improve energy efficiency in commercial buildings.

Issued in Washington, DC, on

Dan W. Reicher
Assistant Secretary
Energy Efficiency and Renewable Energy